

# **SALES ANALYSIS ON BIG BASKET PRODUCTS DATA SET**

**DOMAIN: ECOMMERCE WEBSITES**

**TOOLS USED:** PYTHON FOR DATA CLEANING AND PRE-PROCESSING  
APACHE PIG FOR DATA ANALYSIS

**DATASOURCE:** KAGGLE

<https://www.kaggle.com/hetulmehta/bigbasket-products-dataset>

**SCHEMA:**

PRODUCT, CATEGORY, SUB-CATEGORY, BRAND, TYPE, RATING,  
SALE\_PRICE, MARKET\_PRICE, PROFIT, PROFIT%

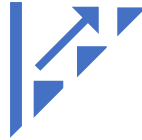
**SIZE:** 22.45 MB



**DATA CLEANING IN PYTHON**

- UNECESSARY COLUMNS LIKE URLS, CODES WERE REMOVED
- NULL VALUES AND DUPLICATES WERE REMOVED
- MISSING VALUES IN RATING COLUMNS WE REPLACED WITH ITS MEDIAN.

**DETAILED EXPLANATION IN JUPYTER NOTEBOOK**



## ANALYSIS PART USING PIG

### 1) LOAD, DESCRIBE AND DUMP OPERATIONS

```
kevin@kevin-VirtualBox: ~/Desktop
grunt> project = LOAD '/home/kevin/Desktop/new.csv' using PigStorage(',') as (product : chararray , category: chararray , sub_category: chararray ,brand:chararray,sale_price:float,market_price:float,type:chararray,rating:float,Profit:float,Profitpercentage:float);
2021-10-03 10:03:03,141 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - io.bytes.per.checksum is deprecated. Instead, use dfs.bytes-per-checksum
grunt> describe project;
project: {product: chararray,category: chararray,sub_category: chararray,brand: chararray,sale_price: float,market_price: float,type: chararray,rating: float,Profit: float,Profitpercentage: float}
grunt> dump project;
```

### DUMPED DATA

```
Terminal
Oct 3 10:04
kevin@kevin-VirtualBox: ~/Desktop

(Almond Oil,Beauty & Hygiene,Skin Care,Aroma Magic ,300.0,400.0,Aromatherapy,2.0,100.0,33.3)
(3-In-1 Face Wash,Beauty & Hygiene,Skin Care,Organic Harvest,182.75,215.0,Face Care,4.0,32.25,17.6)
(Radiant Pearl Cellular Lightening 1 Facial Kit,Beauty & Hygiene,Skin Care,Lotus Herbals,171.5,245.0,Face Care,4.5,73.5,42.9)
(Tea Tree Skin Clearing Scrub,Beauty & Hygiene,Skin Care,BIOTIQUE,142.5,190.0,Face Care,4.1,47.5,33.3)
(Gold Creme Bleach,Beauty & Hygiene,Skin Care,Natures Essence,70.0,70.0,Face Care,3.3,0.0,0.0)
(Skin Fruits Softening Glow Apple Face Wash,Beauty & Hygiene,Skin Care,Joy,97.75,115.0,Face Care,5.0,17.25,17.6)
(Sunscreen Lotion - Carrot,Beauty & Hygiene,Skin Care,Aroma Magic ,148.75,175.0,Face Care,3.7,26.25,17.6)
(Real Nature Tea Tree Face Mask,Beauty & Hygiene,Skin Care,The Face Shop,100.0,100.0,Face Care,4.2,0.0,0.0)
(Dreamcatcher Essential Oil,Beauty & Hygiene,Skin Care,Soulflower,360.0,450.0,Aromatherapy,4.8,90.0,25.0)
(Charcoal Face Scrub,Beauty & Hygiene,Skin Care,INATUR ,315.0,450.0,Face Care,5.0,135.0,42.9)
(Charcoal Peel-Off Face Mask,Beauty & Hygiene,Skin Care,INATUR ,360.0,450.0,Face Care,3.6,90.0,25.0)
(Natural Exfoliating Face Wash For Men & Women,Beauty & Hygiene,Skin Care,Sirona,299.0,375.0,Face Care,4.0,76.0,25.4)
(Cleanser-Moisturiser Combo,Beauty & Hygiene,Skin Care,Kaya Clinic,1190.0,1190.0,Face Care,4.1,0.0,0.0)
(Oxy-Infusion Face Serum,Beauty & Hygiene,Skin Care,Kaya Youth,349.3,499.0,Face Care,1.0,149.7,42.9)
(Activated Charcoal Face Wash - Skin Purifying + Deep Detox,Beauty & Hygiene,Skin Care,Joy,136.5,195.0,Face Care,4.4,58.5,42.9)
(Skin Lightening Shiner Bleach With Diamond Dust,Beauty & Hygiene,Skin Care,Olivvia,17.0,20.0,Face Care,4.3,3.0,17.6)
(Aloe Vera Gel,Beauty & Hygiene,Skin Care,ST. D' VENCE,399.0,399.0,Face Care,3.8,0.0,0.0)
(Essential Oil - Jasmine,Beauty & Hygiene,Skin Care,Aroma Magic ,375.0,500.0,Aromatherapy,5.0,125.0,33.3)
(Rejuvenating Night Cream - Cucumber Lime & Aloe Vera,Beauty & Hygiene,Skin Care,Sri Sri Ayurveda ,70.0,70.0,Face Care,4.0,0.0,0.0)
("Sun Shield - Bio Pink Lentils Matte Look Sunblock, SPF 40",Beauty & Hygiene,Skin Care,,296.25,395.0,,3.0,98.75)
(Vitamin C Brightening Day Cream With SPF 30 UVA/UVB PA+++,Beauty & Hygiene,Skin Care,StBotanica,669.0,669.0,Face Care,5.0,0.0,0.0)
(Hydro Replenish Gentle Face Wash,Beauty & Hygiene,Skin Care,Kaya Youth,139.3,199.0,Face Care,3.7,59.7,42.9)
(Peppermint & Black Seed Lip Polish,Beauty & Hygiene,Skin Care,INATUR ,225.0,300.0,Lip Care,3.0,75.0,33.3)
(Divine Nutritive Cream SPF 20,Beauty & Hygiene,Skin Care,Lotus Organics+,616.25,725.0,Face Care,4.1,108.75,17.6)
(Pristine Purifying Face Wash,Beauty & Hygiene,Skin Care,Lotus Organics+,293.25,345.0,Face Care,4.1,51.75,17.6)
(CoCo Face Mask With Coffee & Cocoa For Glowing Skin,Beauty & Hygiene,Skin Care,Mamaearth,499.0,499.0,Face Care,4.0,0.0,0.0)
(Natural Clay Face Wash,Beauty & Hygiene,Skin Care,The Moms Co,393.0,393.0,Face Care,4.5,0.0,0.0)
(Protecting Gel Face Wash,Beauty & Hygiene,Skin Care,Natures Essence,65.0,65.0,Face Care,3.8,0.0,0.0)
(Moisturizing Cream,Beauty & Hygiene,Skin Care,Sebamed,445.0,559.0,Face Care,4.3,114.0,25.6)
(Earth C7 Argan Oil,Beauty & Hygiene,Skin Care,ColorBar,760.0,800.0,Aromatherapy,5.0,40.0,5.3)
(Tea Tree Anti Imperfection Daily Solution,Beauty & Hygiene,Skin Care,BIOTIQUE,420.0,560.0,Face Care,4.1,140.0,33.3)
(Lip Butter - Rose,Beauty & Hygiene,Skin Care,Organic Harvest,169.15,199.0,Lip Care,1.5,29.85,17.6)
(Intimate Lightening Serum,Beauty & Hygiene,Skin Care,Namyaa,750.0,750.0,Intimate Wash & Care,4.0,0.0,0.0)
(Wine Bleach,Beauty & Hygiene,Skin Care,Astaberry,71.25,75.0,Face Care,3.4,3.75,5.3)
(Pure Aloe Anti Pollution Face Wash,Beauty & Hygiene,Skin Care,Joy,82.5,110.0,Face Care,4.4,27.5,33.3)
(Mulberry & Rose Facewash,Beauty & Hygiene,Skin Care,Vlcc,171.0,190.0,Face Care,4.0,19.0,11.1)
(Cleanser - Mint,Beauty & Hygiene,Skin Care,Aroma Magic ,385.0,550.0,Face Care,3.3,165.0,42.9)
(Scrub - Coffee Bean,Beauty & Hygiene,Skin Care,Aroma Magic ,281.25,375.0,Face Care,4.8,93.75,33.3)
(Fair+Glow Sun Screen Lotion SPF 20,Beauty & Hygiene,Skin Care,Vlcc,178.75,275.0,Face Care,4.7,96.25,53.8)
(Precious Brightening Face Wash,Beauty & Hygiene,Skin Care,Lotus Organics+,408.0,480.0,Face Care,3.0,72.0,17.6)
(Skin Healing Sheet Mask (Pack of 6),Beauty & Hygiene,Skin Care,Mirabelle,392.73,714.0,Face Care,4.1,321.27,81.8)
(Youthrx Anti Ageing Firming Face Masque,Beauty & Hygiene,Skin Care,Lotus Herbals,236.0,295.0,Face Care,3.3,59.0,25.0)
(Natural Baby Cream,Beauty & Hygiene,Skin Care,The Moms Co,393.0,393.0,Face Care,4.3,0.0,0.0)
(Apple Cider Vinegar Imperfection Daily Solution,Beauty & Hygiene,Skin Care,BIOTIQUE,420.0,560.0,Face Care,3.0,140.0,33.3)
("Gold Glow Face Wash For Radiant Skin With Gold, Chandan, Turmeric",Beauty & Hygiene,,12.75,15.0,,4.0)
(Multani Mati,Beauty & Hygiene,Skin Care,Satinance,58.0,58.0,Face Care,3.6,0.0,0.0)
(Ultra Light Aquagel Sunscreen SPF 25,Beauty & Hygiene,Skin Care,Kaya Clinic,406.0,580.0,Face Care,3.5,174.0,42.9)
(Lighten & Smooth Under Eye Gel,Beauty & Hygiene,Skin Care,Kaya Clinic,343.0,490.0,Eye Care,2.8,147.0,42.9)
(Radiant Pearl Cellular Lightening 1 Facial Kit,Beauty & Hygiene,Skin Care,Lotus Herbals,171.5,245.0,Face Care,4.5,73.5,42.9)
```

## QUERIES:

### 1) MAXIMUM RATED PRODUCTS: THAT IS PRODUCTS WITH RATING 5

```
(Premium Adult Diaper Disposal Bags,Beauty & Hygiene,Feminine Hygiene,Sirona,297.5,350.0,Intimate Wash & Care,3.0,32.5,17.6)
grunt> temp1 = FILTER project by rating==5.0;
2021-10-03 10:18:01,491 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 2 time(s).
grunt> dump temp1;
```

## OUTPUT:

```

Oct 3 10:20
kevin@kevin-VirtualBox: ~/Desktop

(Baby Happy Tissues,Baby Care,Diapers & Wipes,Bella,144.0,150.0,Baby Wipes,5.0,0.0,4.2)
(Easy Adult Diaper - Large,Baby Care,Diapers & Wipes,Friends,451.5,525.0,Diapers,5.0,73.5,16.3)
(Dry Pants Diapers - X-Large,Baby Care,Diapers & Wipes,Huggies,319.33,349.0,Diapers,5.0,29.67,9.3)
(Baby Happy Wet Wipes - Milk & Honey,Baby Care,Diapers & Wipes,Bella,189.0,189.0,Baby Wipes,5.0,0.0,0.0)
(Premium Soft Diaper Pants - Extra Small,Baby Care,Diapers & Wipes,Huggies,1091.09,1199.0,Diapers,5.0,107.91,9.9)
(Wonder Pants Large - 99 Diapers,Baby Care,Diapers & Wipes,Huggies,1463.09,1599.0,Diapers,5.0,135.91,9.3)
(Total Care Baby Pants Diapers - S,Baby Care,Diapers & Wipes,Himalaya,1000.0,1000.0,Diapers,5.0,0.0,0.0)
(Baby Happy Two-Layer Universal Tissues,Baby Care,Diapers & Wipes,Bella,417.0,417.0,Baby Wipes,5.0,0.0,0.0)
(Baby Happy Large - 48 Diapers,Baby Care,Diapers & Wipes,Bella,739.0,739.0,Diapers,5.0,0.0,0.0)
(Baby Wipes - Combo Pack,Baby Care,Diapers & Wipes,Morison Baby Dreams,258.0,258.0,Baby Wipes,5.0,0.0,0.0)
(Reusable Diaper Insert Pads,Baby Care,Diapers & Wipes,Paw Paw,339.0,339.0,Diapers,5.0,0.0,0.0)
(Milo,Gourmet & World Food,Drinks & Beverages,Nestle ,550.0,550.0,Health Drinks,5.0,0.0,0.0)
(Nesquik - Strawberry,Gourmet & World Food,Drinks & Beverages,Nestle ,550.0,550.0,Health Drinks,5.0,0.0,0.0)
(Nesquik - Chocolate,Gourmet & World Food,Drinks & Beverages,Nestle ,550.0,550.0,Health Drinks,5.0,0.0,0.0)
(Liver Cleanse Tea,Gourmet & World Food,Drinks & Beverages,Nanhya,589.0,589.0,Health Drinks,5.0,0.0,0.0)
(PCOS Tea,Gourmet & World Food,Drinks & Beverages,Nanhya,589.0,589.0,Health Drinks,5.0,0.0,0.0)
(Sweet Flavour Sattuz,Gourmet & World Food,Drinks & Beverages,Sattuz,120.0,120.0,Health Drinks,5.0,0.0,0.0)
(Spiced Turmeric Latte Mix,Gourmet & World Food,Drinks & Beverages,Rooted Peepul,500.5,599.0,Health Drinks,5.0,29.5,5.3)
(Diabetes Care Tea,Gourmet & World Food,Drinks & Beverages,Nanhya,589.0,589.0,Health Drinks,5.0,0.0,0.0)
(Chocolate Flavour Sattuz,Gourmet & World Food,Drinks & Beverages,Sattuz,150.0,150.0,Health Drinks,5.0,0.0,0.0)
(Chocolate Flavour Sattuz,Gourmet & World Food,Drinks & Beverages,Sattuz,360.0,360.0,Health Drinks,5.0,0.0,0.0)
(Energy Drink Beverages,Energy & Soft Drinks,Red Bull,3480.0,3480.0,Sports & Energy Drinks,5.0,0.0,0.0)
(Non-Alcoholic Beer Bottle - Malt Flavour Beverages,Energy & Soft Drinks,Barbicam ,99.0,99.0,Non Alcoholic Drinks,5.0,0.0,0.0)
(FrutORS - Apple,Beverages,Energy & Soft Drinks,Real,35.0,35.0,Sports & Energy Drinks,5.0,0.0,0.0)
(Easy Grip 360-Degree Trainer Sipper Cup - Blue,Baby Care,Feeding & Nursing,Mee Mee,399.0,399.0,Baby Dishes & Utensils,5.0,0.0,0.0)
(Standard Neck Nursing Bottle KPP With S-Type Nipple - Light Blue,Baby Care,Feeding & Nursing,Pigeon Baby,255.0,255.0,Sippers & Bottles,5.0,0.0,0.0)
(Ultra Absorbent Disposable Period Panties for Sanitary Protection - S-M,Beauty & Hygiene,Feminine Hygiene,Eve,Eve,50.0,100.0,Sanitary Napkins,5.0,50.0,100.0)
(Regimen Kit - 1 Razor + 2 Refills + 1 Satin Care Sensitive Skin Gel,Beauty & Hygiene,Feminine Hygiene,Gillette Venus,799.2,999.0,Hair Removal,5.0,199.8,25.0)
(Hair Removal Waxing Kit - Normal Skin,Beauty & Hygiene,Feminine Hygiene,Veet,179.1,199.0,Hair Removal,5.0,19.9,11.1)
(Venus Snap Hair Remover For Smooth Skin - Women,Beauty & Hygiene,Feminine Hygiene,Gillette,799.0,799.0,Hair Removal,5.0,0.0,0.0)
(Panty Liners - Intima Plus Extra Long,Beauty & Hygiene,Feminine Hygiene,Bella,249.0,249.0,Panty Liners,5.0,0.0,0.0)
(100% Pure US Cotton Ultra Thin Sanitary Pads - Travel Pack,Beauty & Hygiene,Feminine Hygiene,Plush,25.0,25.0,Sanitary Napkins,5.0,0.0,0.0)
(Premium Digital Tampon - Heavy Flow,Beauty & Hygiene,Feminine Hygiene,Sirona,146.2,215.0,Tampons & Menstrual Cups,5.0,68.8,47.1)
(Perfecta Ultra Silky Drai Sanitary Napkins,Beauty & Hygiene,Feminine Hygiene,Bella,150.0,150.0,Sanitary Napkins,5.0,0.0,0.0)
(Premium Applicator Tampons - Regular Flow,Beauty & Hygiene,Feminine Hygiene,Sirona,403.2,630.0,Tampons & Menstrual Cups,5.0,226.8,56.2)
(Freshening Intimate Wash - Natural,Beauty & Hygiene,Feminine Hygiene,Sirona,169.15,199.0,Intimate Wash & Care,5.0,29.85,17.6)
(Panty Liners - Intima Plus Normal,Beauty & Hygiene,Feminine Hygiene,Bella,239.0,239.0,Panty Liners,5.0,0.0,0.0)
(Premium Digital Tampon - Heavy Flow,Beauty & Hygiene,Feminine Hygiene,Sirona,227.01,329.0,Tampons & Menstrual Cups,5.0,101.99,44.9)
(Portable Female Urination Device For Women - Disposable,Beauty & Hygiene,Feminine Hygiene,Peebuddy,276.25,325.0,Intimate Wash & Care,5.0,48.75,17.6)
(Clean & Pure Intimate Hygiene Wash With Tea Tree Oil & Sea Buckthorn,Beauty & Hygiene,Feminine Hygiene,Dr. Morepen,161.0,175.0,Intimate Wash & Care,5.0,14.0,8.7)
(Premium Adult Diaper Disposal Bags,Beauty & Hygiene,Feminine Hygiene,Sirona,148.75,175.0,Intimate Wash & Care,5.0,26.25,17.6)
(After Waxing Oil - Lavender,Beauty & Hygiene,Feminine Hygiene,Jeva,337.5,450.0,Hair Removal,5.0,112.5,33.3)
(Liposoluble Wax - Banana,Beauty & Hygiene,Feminine Hygiene,Jeva,712.5,950.0,Hair Removal,5.0,237.5,33.3)
(Tampons - Regular,Beauty & Hygiene,Feminine Hygiene,Floah,115.0,115.0,Tampons & Menstrual Cups,5.0,0.0,0.0)
(Premium Adult Diaper Disposal Bags,Beauty & Hygiene,Feminine Hygiene,Sirona,297.5,350.0,Intimate Wash & Care,5.0,52.5,17.6)

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FROM THE OUTPUT WE CAN SEE THAT THE HIGHEST RATED PRODUCTS ARE : DRINKS(TEA) , SANITARY PRODUCTS AND PRODUCTS FOR BABIES LIKE TISSUES, DIAPERS ETC.

## 2) MINIMUM RATED PRODUCTS: THAT IS PRODUCTS WITH RATING 1

```

grunt> temp2 = FILTER project by rating==1.0;
2021-10-03 10:20:55,013 [main] WARN  org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPL
ICIT_CAST_TO_DOUBLE 3 time(s).
grunt> dump temp2

```

OUTPUT:



```
(Acnoklin-Rs Gel Face Wash,Beauty & Hygiene,Skin Care,Vegetal,220.0,220.0,Face Care,1.0,0.0,0.0)
(Massage Oil - Apricot Kernel Oil,Beauty & Hygiene,Skin Care,Aloe Veda,472.5,525.0,Aromatherapy,1.0,52.5,11.1)
(Sunscreen SPF 30,Beauty & Hygiene,Skin Care,Organic Harvest,420.75,495.0,Face Care,1.0,74.25,17.6)
(Glow Oxy Bleach Crene,Beauty & Hygiene,Skin Care,Globus,192.0,240.0,Face Care,1.0,48.0,25.0)
(Retinol Advanced Anti Aging Face Mist,Beauty & Hygiene,Skin Care,StBotanica,699.0,699.0,Face Care,1.0,0.0,0.0)
(Coconut Oil,Beauty & Hygiene,Skin Care,St. D'VENCE,254.0,299.0,Aromatherapy,1.0,45.0,17.7)
(Urban Balance Daily Scrub Cleanser,Beauty & Hygiene,Skin Care,Faces,411.75,549.0,Face Care,1.0,137.25,33.3)
(Face Cream - Fairness,Beauty & Hygiene,Skin Care,Vegetal,260.0,260.0,Face Care,1.0,0.0,0.0)
(Body Moisturising Lotion,Beauty & Hygiene,Skin Care,Vegetal,340.0,340.0,Body Care,1.0,0.0,0.0)
(Body Massage Oil - Jasmine & Nargis,Beauty & Hygiene,Skin Care,Oriental Botanics,899.0,899.0,Aromatherapy,1.0,0.0,0.0)
(Gardenia Essential Oil,Beauty & Hygiene,Skin Care,Organic Harvest,311.6,410.0,Aromatherapy,1.0,98.4,31.6)
(Facial Kit - Pearl,Beauty & Hygiene,Skin Care,Arona Magic ,690.0,1150.0,Face Care,1.0,460.0,66.7)
(Gold Kit,Beauty & Hygiene,Skin Care,Natures Essence,1800.0,1800.0,Face Care,1.0,0.0,0.0)
(Diamond Kit,Beauty & Hygiene,Skin Care,Natures Essence,1800.0,1800.0,Face Care,1.0,0.0,0.0)
(Face and Body Mist - Frankincense,Beauty & Hygiene,Skin Care,ORGANIC INDIA,325.0,325.0,Body Care,1.0,0.0,0.0)
(Rich Hand V Special Care Hand Mask,Beauty & Hygiene,Skin Care,The Face Shop,212.5,250.0,Body Care,1.0,37.5,17.6)
(Merry Cherry Lip Balm - SPF 20,Beauty & Hygiene,Skin Care,BIOTIQUE,111.75,149.0,Lip Care,1.0,37.25,33.3)
(Caramel & Cedarwood Moisturizer,Beauty & Hygiene,Skin Care,RawNature,324.35,499.0,Face Care,1.0,174.65,53.8)
(Anti-Aging Night Cream,Beauty & Hygiene,Skin Care,INATUR ,337.5,450.0,Face Care,1.0,112.5,33.3)
(Pairy Oil,Beauty & Hygiene,Skin Care,Arona Magic ,300.0,400.0,Aromatherapy,1.0,100.0,33.3)
(Avocado Cold Pressed Oil,Beauty & Hygiene,Skin Care,Myasso,900.0,900.0,Aromatherapy,1.0,0.0,0.0)
(Rushikanti Multant Mitti With Rose,Beauty & Hygiene,Skin Care,Akshara Herbals,50.0,50.0,Face Care,1.0,0.0,0.0)
(Charcoal Detox Over Night Repair Face Cream,Beauty & Hygiene,Skin Care,INATUR ,350.0,500.0,Face Care,1.0,150.0,42.9)
(Ayurvedic Tea Tree & Activated Charcoal Face Pack,Beauty & Hygiene,Skin Care,Natural Vibes,499.0,499.0,Face Care,1.0,0.0,0.0)
(Aloe 90% Soothing Gel,Beauty & Hygiene,Skin Care,It's Skin,400.0,400.0,Face Care,1.0,0.0,0.0)
(Family Sunscreen Lotion SPF 25,Beauty & Hygiene,Skin Care,INATUR ,273.0,420.0,Face Care,1.0,147.0,53.8)
(Lip Butter - Chocolate,Beauty & Hygiene,Skin Care,Aloe Veda,225.0,225.0,Lip Care,1.0,0.0,0.0)
(Energy Essential Oil,Beauty & Hygiene,Skin Care,Soulflower,328.0,450.0,Aromatherapy,1.0,122.0,37.2)
(Herbal Gold Thermo Herb,Beauty & Hygiene,Skin Care,Khadi Natural,175.0,250.0,Face Care,1.0,75.0,42.9)
(Bananna Treat Chilll Masala,Snacks & Branded Foods,Snacks & Namkeen,FruitTreat,52.5,70.0,Namkeen & Savoury Snacks,1.0,17.5,33.3)
(Ragi Bites - Epic Masala,Snacks & Branded Foods,Snacks & Namkeen,Soulfull,20.0,20.0,Namkeen & Savoury Snacks,1.0,0.0,0.0)
(Disney Cinderella Princess PVC Embossed Pencil Bag - HHHTPB 72231-CIN,Cleaning & Household,Stationery,Hm International,100.0,199.0,Exam Pads & Pencil Box,1.0,39.0,24.4)
(Organics Indian Turmeric Tea,Beverages,Tea,10 Herbs,345.0,345.0,Leaf & Dust Tea,1.0,0.0,0.0)
(Darjeeling Green Tea - Ahimsa Long Leaf,Beverages,Tea,Teamonk,385.0,550.0,Exotic & Flavoured Tea,1.0,165.0,42.9)
(Sandwich Slices,Gourmet & World Food,Tinned & Processed Food,Entree,125.4,132.0,Tomatoes & Vegetables,1.0,6.6,5.3)
(Keto Pancake Mix,Gourmet & World Food,Cooking & Baking Needs,Ketofy,499.0,499.0,Flours & Pre-Mixes,1.0,0.0,0.0)
(Gluten-Free Vegetable Millet Khichdi Mix,Gourmet & World Food,Cooking & Baking Needs,Graininway,350.0,350.0,Flours & Pre-Mixes,1.0,0.0,0.0)
(Cream - Original,Gourmet & World Food,Dairy & Cheese,Nestle ,262.5,350.0,Milk & Soya Drinks,1.0,87.5,33.3)
(Wonder Pants Diapers - Small Size,Baby Care,Diapers & Wipes,Huggies,407.63,450.0,Diapers,1.0,42.37,10.4)
(Total Care Baby Pants Diapers - L,Baby Care,Diapers & Wipes,Himalaya,1065.0,1200.0,Diapers,1.0,135.0,12.7)
(Aloe Vera Juice - Purifies Blood & Boosts Immunity,Gourmet & World Food,Drinks & Beverages,Jiva Ayurveda,220.0,220.0,Health Drinks,1.0,0.0,0.0)
(Japanese Matcha Tea - 2 In 1 For Hot or Iced,Gourmet & World Food,Drinks & Beverages,Care,250.0,250.0,Health Drinks,1.0,0.0,0.0)
(Hibiscus & Red Melon Green Tea - 2 In 1 For Hot & Iced,Gourmet & World Food,Drinks & Beverages,Care,250.0,250.0,Health Drinks,1.0,0.0,0.0)
(Turtle Sipper - Green,Baby Care,Feeding & Nursing,Luvlap,245.0,245.0,Sippers & Bottles,1.0,0.0,0.0)
(Pro Super Soft Reusable FDA Approved Menstrual Cup With Medical Grade Silicon - Medium,Beauty & Hygiene,Feminine Hygiene,Sirona,719.1,799.0,Tampons & Menstrual Cups,1.0,79.9,11.1)
```

FROM THE OUTPUT WE CAN SEE THAT THE LEAST RATED PRODUCTS ARE : BEAUTY ,SKIN-CARE AND HYGEIENE TYPE PRODUCTS AND SOME FOOD ITEMS.

### 3) NUMBER OF PRODUCTS PER BRAND:

```
grunt> gbrand = GROUP project by brand;
2021-10-03 10:26:01,147 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 3 time(s).
grunt> describe gbrand;
gbrand: {group: chararray,project: {(product: chararray,category: chararray,sub_category: chararray,brand: chararray,sale_price: float,market_price: float,discount_percentage: float)}}
grunt> cnt_prod = foreach gbrand generate group , COUNT(project);
2021-10-03 10:27:11,870 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 3 time(s).
grunt> dump cnt_prod;
```

OUTPUT:

```

(Z,2)
(DP,11)
(Fa,3)
(HE,1)
(JK,1)
(KM,2)
(LG,1)
(Ob,1)
(Ok,1)
(Re,1)
(V2,2)
(iD,6)
(&Me,2)
(365,1)
(3B0,4)
(9t9,6)
(Aer,2)
(Axe,35)
(BGR,3)
(BSY,1)
(Cif,4)
(Cpp,1)
(DND,1)
(Dip,6)
(Ela,15)
(Eva,5)
(Exo,5)
(Fem,17)
(GPC,4)
(Grb,5)
(HIT,6)
(Hii,1)
(IK0,1)
(IN2,8)
(Iba,7)
(Ifb,1)
(Joy,39)
(KCL,3)
(Kvg,1)
(Lal,1)
(Lee,1)
(Lux,9)
(MOM,10)
(MTR,65)
(MVS,2)
(Mud,1)
(NSH,1)
(Neo,17)
(OCV,2)

```

**FROM THE OUTPUT WE CAN SEE BRAND WISE COUNT OF PRODUCTS.**

**BRANDS like FRESHO , BBHOME ,COLGATE ETC.HAVE MORE NO. OF PRODUCTS.**

#### **4) TOTAL PROFIT MADE BY EACH BRAND**

```
grunt> gbrand = GROUP project by brand;
2021-10-03 10:44:34,012 [main] WARN  org.apache
grunt> mpb = foreach gbrand {
>>   ordp = order project by Profit desc;
>>   maxpro = limit ordp 1;
>>   generate group , SUM(project.Profit);
>> };
2021-10-03 10:45:14,928 [main] WARN  org.apache
grunt> dump mpb;
```

**OUTPUT:**



```

(Al' Fez,0.0)
(Alkalen,0.0)
(All Out,94.0)
(Alvizia,476.0400085449219)
(Ambipur,0.0)
(Amrutha,7.400000095367432)
(Aramusk,445.0)
(Azafran,1528.9499998092651)
(BB Home,841.1000018119812)
(Bacto-V,0.0)
(Bagrrys,297.25)
(Bambino,0.0)
(Batiste,0.0)
(Battler,0.0)
(Beanies,140.0)
(Befikar,0.0)
(Bentley,2970.0)
(Bio-Oil,229.0)
(Bionova,0.0)
(Bolst's,0.0)
(Brimune,0.0)
(Britte ,0.0)
(Brother,38.75)
(Buffet ,0.0)
(Bvlgari,0.0)
(Cadbury,249.31999871134758)
(CamPure,0.0)
(Canopus,0.0)
(Carmesi,0.0)
(Cartini,57.99999952316284)
(Chaayos,0.0)
(Charmis,64.9000015258789)
(Cheetos,0.0)
(Cinthol,326.9600028991699)
(Clenz U,0.0)
(Closeup,90.0)
(Cocojal,0.0)
(Colgate,2918.3999996185303)
(Comfort,35.100000858306885)
(D-Alive,3.5)
(Daadis ,12.699999809265137)
(Daarzel,91.35000038146973)
(Delishh,4.799999952316284)
(Dexolac,0.0)
(Dheepam,0.0)
(Diamond,1.0)
(Dimples,0.0)
(Doritos,17.0)
(EI DASH,0.0)

```

**TOTAL PROFIT MADE BY EACH BRAND IN RUPEES IS SHOWN IN THE OUTPUT.**

## **5) AVERAGE RATING PER BRAND**

```
grunt> gbrand = GROUP project by brand;
2021-10-03 11:16:11,170 [main] WARN org.apache.pig.newplan.BaseOperatorPlan -
grunt> e = foreach gbrand generate group , ROUND(AVG(project.rating));
2021-10-03 11:16:24,271 [main] WARN org.apache.pig.newplan.BaseOperatorPlan -
grunt>
```

## OUTPUT:

```
(Keya,4)
(Kiwi,4)
(LISO,1)
(Lays,4)
(MOOZ,4)
(Mars,5)
(Maxi,4)
(Maxo,4)
(Maya,)
(Moov,4)
(NOCD,4)
(Nice,5)
(Nike,4)
(Nova,3)
(Nyle,4)
(OGMO,3)
(Olay,4)
(Only,4)
(Ongs,4)
(Open,4)
(Opex,4)
(Oreo,4)
(PIPO,4)
(Plum,4)
(Polo,)
(Post,4)
(Pril,4)
(Pure,4)
(QIPS,5)
(QRAA,4)
(RYCA,)
(Rage,)
(Real,4)
(Red",)
(Rica,4)
(SOVI,5)
(Seni,4)
(Smac,4)
(Sofy,4)
(Solo,4)
(Tagz,4)
(Tang,4)
(Tirol,5)
```

**AVERAGE RATING PER BRAND IS SEEN IN THE OUTPUT I.E OUTPUT RATINGS IN THE RANGE(1-5)**

BRANDS LIKE OREO ,TANG HAVE AVERAGE RATING 4 AND BRANDS LIKE MARS AND NICE HAVE AVERAGE RATING 5

## 6) MOST PROFITABLE PRODUCT

```
grunt> h1 = group project all;
2021-10-03 12:04:47,111 [main] WARN org.apache.pig.newplan.B
grunt> I = foreach h1 generate MAX(project.Profit) as max;
2021-10-03 12:05:41,872 [main] WARN org.apache.pig.newplan.B
grunt> x = filter project by Profit==I.max;
2021-10-03 12:06:09,087 [main] WARN org.apache.pig.newplan.B
grunt> dump x;
```

### OUTPUT:

```
2021-10-03 12:06:15,550 [main] INFO org.apache.hadoop.mapreduce.lib.input.TextInputFormat
2021-10-03 12:06:15,550 [main] INFO org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil
("Premium Cloth Dryer/Drying Stand - Foldable, Silver, BB 1434","Kitchen,,,DP,4649.0,8969.0,)
grunt> █
```

FROM THE OUTPUT WE CAN SEE THE MOST PROFITABLE PRODUCT IS PREMIUM CLOTH DRYER FROM THE BRAND DP

## 7) LEAST PROFITABLE PRODUCTS

```
grunt> h1 = group project all;
2021-10-03 12:00:15,950 [main] INFO org.apache.pig.newplan.B
g Thunderbird Mail ach h1 generate MIN(project.Profit) as min;
2021-10-03 12:24:49,976 [main] WARN org.apache.pig.newplan.B
grunt> x = filter project by Profit==I.min;
2021-10-03 12:27:27,121 [main] WARN org.apache.pig.newplan.B
grunt> dump x;
```

### OUTPUT:

```
(Clothes Disinfectant & Refreshing Spray,Cleaning & Household,All Purpose Cleaners,Savlon,175.0,175.0,Disinfectant Spray & Cleaners,4.5,0.0,0.0)
(bb Home Floor Cleaner - Neem 500 ml + bb Home Floor Cleaner - Citrus 500 ml,Cleaning & Household,All Purpose Cleaners,bb Combo,196.0,196.0,Floor & Other Cleaners,4.1,0.0,0.0)
(Black Phenyl,Cleaning & Household,All Purpose Cleaners,Germt Chek,48.0,48.0,Floor & Other Cleaners,4.2,0.0,0.0)
(Perfumed Herbal Phenyle - White,Cleaning & Household,All Purpose Cleaners,Smart Home,60.0,60.0,Floor & Other Cleaners,4.1,0.0,0.0)
(Floor Cleaner - Pine White,Cleaning & Household,All Purpose Cleaners,Honey Home Fresh,50.0,50.0,Floor & Other Cleaners,4.0,0.0,0.0)
(Phenyle - Sensation (Herbal 2 in 1),Cleaning & Household,All Purpose Cleaners,Germisol,60.0,60.0,Floor & Other Cleaners,4.2,0.0,0.0)
(Platinum Active-Shield Disinfectant Toilet Cleaner Liquid - Marine,Cleaning & Household,All Purpose Cleaners,Harpic,99.0,99.0,Toilet Cleaners,4.3,0.0,0.0)
(Toilet Air Freshener - Lavender,Cleaning & Household,All Purpose Cleaners,Odoril,49.0,49.0,Toilet Cleaners,4.1,0.0,0.0)
(Toilet Cleaner - Lemon,Cleaning & Household,All Purpose Cleaners,BB Home,168.0,168.0,Toilet Cleaners,4.1,0.0,0.0)
(Platinum Active-Shield Disinfectant Toilet Cleaner Liquid - Lavender,Cleaning & Household,All Purpose Cleaners,Harpic,99.0,99.0,Toilet Cleaners,4.3,0.0,0.0)
(Power Plus Disinfectant Toilet Cleaner,Cleaning & Household,All Purpose Cleaners,Harpic,356.0,356.0,Toilet Cleaners,4.4,0.0,0.0)
(Disinfectant Toilet Cleaner Pro - Colour Changing Formula - Kills 99.9% germs,Cleaning & Household,All Purpose Cleaners,BB Home,91.0,91.0,Toilet Cleaners,4.1,0.0,0.0)
(Dishwasher Salt,Cleaning & Household,All Purpose Cleaners,Fortune,200.0,200.0,Imported Cleaners,5.0,0.0,0.0)
(Fabric Softener - Classic Blue,Cleaning & Household,All Purpose Cleaners,Comfort,450.0,450.0,Imported Cleaners,4.1,0.0,0.0)
(Bleach - Original,Cleaning & Household,All Purpose Cleaners,Clorox,550.0,550.0,Floor & Other Cleaners,4.4,0.0,0.0)
(Disinfecting Wipes - Fresh Scent,Cleaning & Household,All Purpose Cleaners,Clorox,450.0,450.0,Disinfectant Spray & Cleaners,4.6,0.0,0.0)
(Dishwasher Tablet,Cleaning & Household,All Purpose Cleaners,Fortune,440.0,440.0,Imported Cleaners,5.0,0.0,0.0)
(Fabric Conditioner - Rose Fresh,Cleaning & Household,All Purpose Cleaners,Comfort,450.0,450.0,Imported Cleaners,3.0,0.0,0.0)
(Bleach - Lemon,Cleaning & Household,All Purpose Cleaners,Clorox,160.0,160.0,Floor & Other Cleaners,4.1,0.0,0.0)
(Floor Cleaner - Lime,Cleaning & Household,All Purpose Cleaners,Florona,70.0,70.0,Floor & Other Cleaners,3.8,0.0,0.0)
(Toilet Air Freshener - Rose,Cleaning & Household,All Purpose Cleaners,Odoril,49.0,49.0,Toilet Cleaners,4.1,0.0,0.0)
(Disinfectant Bathroom Cleaner - Lemon,Cleaning & Household,All Purpose Cleaners,Harpic,44.0,44.0,Floor & Other Cleaners,4.1,0.0,0.0)
(Herbal Floor Cleaner,Cleaning & Household,All Purpose Cleaners,Nmyle,84.0,84.0,Floor & Other Cleaners,5.0,0.0,0.0)
(Rinse Aid,Cleaning & Household,All Purpose Cleaners,Fortune,150.0,150.0,Imported Cleaners,3.0,0.0,0.0)
(Dishwasher Salt,Cleaning & Household,All Purpose Cleaners,Finish,340.0,340.0,Imported Cleaners,5.0,0.0,0.0)
(Disinfecting Wipes Fresh Scent,Cleaning & Household,All Purpose Cleaners,Clorox,250.0,250.0,Imported Cleaners,4.1,0.0,0.0)
(Bathroom Cleaner,Cleaning & Household,All Purpose Cleaners,BB Home,91.0,91.0,Toilet Cleaners,4.1,0.0,0.0)
(Disinfectant Bathroom Cleaner - Floral,Cleaning & Household,All Purpose Cleaners,Harpic,44.0,44.0,Floor & Other Cleaners,4.2,0.0,0.0)
(Visible Power Toilet Cleaner,Cleaning & Household,All Purpose Cleaners,Mr Muscle,75.0,75.0,Toilet Cleaners,4.2,0.0,0.0)
(Bleach - Lavender,Cleaning & Household,All Purpose Cleaners,Clorox,160.0,160.0,Floor & Other Cleaners,4.4,0.0,0.0)
(Proclean Floor Cleaner - Lavender,Cleaning & Household,All Purpose Cleaners,Godrej,179.0,179.0,Floor & Other Cleaners,4.5,0.0,0.0)
(Disinfecting Wipes Fresh Scent,Cleaning & Household,All Purpose Cleaners,Clorox,130.0,130.0,Imported Cleaners,4.1,0.0,0.0)
(Bleach - Lemon,Cleaning & Household,All Purpose Cleaners,Clorox,550.0,550.0,Floor & Other Cleaners,4.3,0.0,0.0)
(Herbal Floor Cleaner,Cleaning & Household,All Purpose Cleaners,Nmyle,156.0,156.0,Floor & Other Cleaners,4.1,0.0,0.0)
(Toilet Seat Sanitizer - Deodoriser,Cleaning & Household,All Purpose Cleaners,Sanitiz,150.0,150.0,Toilet Cleaners,3.7,0.0,0.0)
(IMPORTED - 3Ply Kitchen Towel Super Absorbent Paper Tissue Roll,Cleaning & Household,All Purpose Cleaners,Selpak,1340.0,1340.0,Imported Cleaners,4.5,0.0,0.0)
(Heavy Starch - Fresh Lavender Scent,Cleaning & Household,All Purpose Cleaners,Faultless,570.0,570.0,Imported Cleaners,4.0,0.0,0.0)
(Clean-Up All-Purpose Cleaner with Bleach,Cleaning & Household,All Purpose Cleaners,Clorox,425.0,425.0,Floor & Other Cleaners,4.3,0.0,0.0)
(Gottle Tap Cleaner - Multipurpose Cleaner,Cleaning & Household,All Purpose Cleaners,GOTILE,375.0,375.0,Imported Cleaners,4.1,0.0,0.0)
(Ato Max Dishwasher Tablets - Regular,Cleaning & Household,All Purpose Cleaners,Finish,599.0,599.0,Imported Cleaners,4.1,0.0,0.0)
(Multipurpose Germ Protection Anti-Bacterial Wipes with Lemon Fragrance,Cleaning & Household,All Purpose Cleaners,Corsafe Advance,100.0,100.0,Disinfectant Spray & Cleaners,4.1,0.0,0.0)
(Dishwasher - Cleaner,Cleaning & Household,All Purpose Cleaners,Clean N Fresh,279.0,279.0,Floor & Other Cleaners,4.0,0.0,0.0)
(Dishwasher Tablets,Cleaning & Household,All Purpose Cleaners,Cleox,575.0,575.0,Imported Cleaners,1.0,0.0,0.0)
(Rinse Aid,Cleaning & Household,All Purpose Cleaners,Clean N Fresh,249.0,249.0,Imported Cleaners,4.1,0.0,0.0)
(Dishwasher Tablets,Cleaning & Household,All Purpose Cleaners,Cleox,1400.0,1400.0,Imported Cleaners,4.1,0.0,0.0)
(Polish Warrish Remover - Silver Wipes,Cleaning & Household,All Purpose Cleaners,Meitner,650.0,650.0,Imported Cleaners,4.1,0.0,0.0)
(Cleaning Acid,Cleaning & Household,All Purpose Cleaners,Zermitol,58.0,58.0,Floor & Other Cleaners,4.2,0.0,0.0)
(Floor Cleaner - Sandal,Cleaning & Household,All Purpose Cleaners,Florona,300.0,300.0,Floor & Other Cleaners,3.9,0.0,0.0)
```

FROM THE OUTPUT WE CAN SEE THE PRODUCTS WITH 0 RUPEES PROFIT AND THESE ARE MOSTLY THE PRODUCTS THAT FALL IN THE CATEGORY OF HOUSEHOLD/CLEANING ETC.

## 8) MOST EXPENSIVE PRODUCT

```
grunt> h1 = group project all;
2021-10-03 12:39:23,643 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning
IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> I = foreach h1 generate MAX(project.sale_price) as exp;
2021-10-03 12:39:50,249 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning
IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> x = filter project by sale_price==I.exp;
2021-10-03 12:40:09,023 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning
IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> dump x;
```

## OUTPUT:

```
- Total input paths to process : 1
(Epilator SE9-9961 Legs-Body-Face,Beauty & Hygiene,Feminine Hygiene,Braun,8184.44,10769.0,Hair Rem
oval,4.1,2584.56,31.6)
grunt>
```

FROM THE OUTPUT WE CAN SEE EPILATOR IS THE MOST EXPENSIVE PRODUCT AS PER SALE PRICE.

## 9) CHEAPEST PRODUCT

```
kevin@kevin-VirtualBox: ~/Desktop
2021-10-03 12:48:00,034 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> I = foreach h1 generate MIN(project.sale_price) as cheap;
2021-10-03 12:48:17,939 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> x = filter project by sale_price==I.cheap;
2021-10-03 12:48:25,078 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> dump x;
```

## OUTPUT:

```
cc - Total input paths to process : 1
(Curry Leaves,Fruits & Vegetables,Herbs & Seasonings,Fresho,2.45,15.0,Indian & Exotic Herbs,4.1,12.55,512.2)
grunt>
```

**FROM THE OUTPUT THE CHEAPEST PRODUCT IS FOUND TO BE CURRY LEAVES**

## 10)NUMBER OF PRODUCTS PER TYPE

```
kevin@kevin-VirtualBox: ~/Desktop
2021-10-03 13:07:06,132 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> rs = foreach tg generate group , COUNT(project);
2021-10-03 13:07:32,149 [main] WARN org.apache.pig.newplan.BaseOperatorPlan - Encountered Warning IMPLICIT_CAST_TO_DOUBLE 4 time(s).
grunt> dump rs;
```

## OUTPUT:

(Antiseptics & Bandages,25)  
(Baby Dishes & Utensils,7)  
(Cooking & Baking Needs,5)  
(Cream & Cheese Spreads,14)  
(Electronic Accessories,12)  
(Exam Pads & Pencil Box,21)  
(Exotic & Flavoured Tea,47)  
(Extra Virgin Olive Oil,50)  
(Flavoured & Other Oils,51)  
(Floor & Other Cleaners,113)  
(Floss & Tongue Cleaner,3)  
(Fresh Salads & Sprouts,10)  
(Gourmet Tea & Tea Bags,295)  
(Hair & Scalp Treatment,67)  
(Hand Wash & Sanitizers,206)  
(Heat & Eat Ready Meals,134)  
(Moustache & Beard Care,69)  
(Other Baby Accessories,3)  
(Pet Food & Accessories,3)  
(Shower Gel & Body Wash,125)  
(Sports & Energy Drinks,19)  
(Supplements & Proteins,207)  
(Breakfast & Snack Mixes,201)  
(Cream Biscuits & Wafers,94)  
(Dishwash Bars & Powders,29)  
(Glucose & Milk Biscuits,18)  
(Gourmet Juices & Drinks,92)  
(Maternity Personal Care,15)  
(Regular & White Vinegar,5)  
(Soap Cases & Dispensers,10)  
(Appliances & Electricals,13)  
(Balsamic & Cider Vinegar,35)  
(Body Scrubs & Exfoliants,10)  
(Disposable Cups & Plates,16)  
(Flavoured & Greek Yogurt,22)  
(Imported Oats & Porridge,51)  
(International Chocolates,103)  
(Namkeen & Savoury Snacks,265)  
(Organic & Cold Press Oil,16)  
(Tampons & Menstrual Cups,26)  
(Dhatu Organics & Naturals,3)  
(Dishwash Liquids & Pastes,39)  
(Dry Shampoo & Conditioner,8)  
(Face Masks & Safety Gears,34)  
(Maternity Health Supplements,5)  
(Disinfectant Spray & Cleaners,62)

**FROM THE OUTPUT WE CAN SEE COUNT BY TYPE**

**FACE CARE , SHAMPOO ,HANDWASH HAVE HIGH NUMBERS.**

**CONCLUSION:**



**MOST PROFITABLE CATEGORIES ARE:**

**BEAUTY & HYGIENE**

**Comparatively fruits and vegetables and cleaning products are least profitable**

**So marketing and advertising or discounts can be added**

**And low rated products like cleaning and household should be also taken care using similar strategies in order to increase sales and profit.**